

Facility: Shearon Harris Task No.: 015004H201  
Task Title: Perform the Quadrant Power Tilt Ratio Surveillance JPM No.: 2013 NRC Exam Admin JPM RO A2  
K/A Reference: G2.2.12 RO 3.7 SRO 4.1 **Alternate Path: No**

Examinee: \_\_\_\_\_ NRC Examiner: \_\_\_\_\_  
Facility Evaluator: \_\_\_\_\_ Date: \_\_\_\_\_

Method of testing:

Simulated Performance: \_\_\_\_\_ Actual Performance: X  
Classroom X Simulator \_\_\_\_\_ Plant \_\_\_\_\_

**READ TO THE EXAMINEE**

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

**Initial Conditions:**

- The plant is operating at 90% power when a rod in Control Bank 'A' (P-10) dropped.
- The crew is performing AOP-001, MALFUNCTION OF ROD CONTROL AND INDICATION SYSTEM.
- There are NO deficiency tags on PR NIs.
- ERFIS points ANM9112U and ANM9113L have a BAD quality code. HNP IT has been notified and they are evaluating the ERFIS points.

**Initiating Cue:**

The CRS has directed you to perform a manual QPTR IAW OST-1039, CALCULATION OF QPTR. The Power Range NIS indications are provided.

**For the purposes of the examination, there will be no independent verification. Show values of your work.**

Task Standard: Calculations within required band.  
Correct Tech Spec actions are identified.

Required Materials: Calculator

General References: OST-1039, CALCULATION OF QPTR, Revision 16  
Technical Specifications

Handouts:

- OST-1039
- Power Range NI – Current and Voltage Set point Table
- Technical Specifications

Time Critical Task: No

Validation Time: 10 minutes

Critical Step Justification	
<b>Step 11</b>	Must accurately determine the correct calculation based on collecting and inputting either provided data or visual inspection data. The calculation will yield an unsatisfactory QPTR.
<b>Step 14</b>	Must identify that the QPTR upper is outside the band which will make this overall results unsatisfactory.
<b>Step 15</b>	Must unsatisfactory that the QPTR is greater than 1.02 (which is a Tech Spec limit).
<b>Step 19</b>	Must correctly identify through documentation that the QPTR limits are exceeded.

**Start Time:** \_\_\_\_\_.**Performance Step: 1** Obtain procedure.**Standard:** Reviews procedure.

<b>Evaluator Cue:</b>	<b>Provide OST-1039.</b>
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**Evaluator Note:** A KEY is provided for your use on JPM prior to candidate pages.**Comment:**

<b>Evaluator Note:</b>	<b>NOTE: The NI curve numbers provided in this JPM are numbers from the 2013 NRC Exam Frozen Procedures Curve Book folder.</b>
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**Procedure Note:** Precaution and Limitation 4.0.1 has guidance if performing this OST with one Power Range Channel inoperable.

**Performance Step: 2** Completes Prerequisites section:

- Verify instrumentation needed for the performance of this test is free of deficiencies that affect instrument indication.
- Verify the most recent Curve F-X-8 is used in the performance of this procedure. (Reference 2.1.1 and 2.1.2)
- OBTAIN CRS permission to perform this OST.

**Standard:**

- Logs F-18-8 revision number : 6
- Initials/signs all blocks

**Comment:**

- Performance Step: 3**
- IF Quadrant Power Tilt Ratio Calculation Computer Program is used, THEN PERFORM the following:
    - MARK Step 7.0.2 N/A.
    - MARK Section 7.2 N/A.
    - PERFORM Section 7.1.
  - IF manual calculation of the Quadrant Power Tilt Ratio is used, THEN PERFORM the following:
    - MARK Section 7.1 N/A.
    - PERFORM Section 7.2.

- Standard:**
- Marks Section 7.1 N/A
  - Proceeds to Section 7.2

**Comment:**

**OST-1039 Section 7.2 Note prior to step 1**

- Performance Step: 4**      **NOTE:** The detector current meters on each power range channel drawer are designated as left-upper, right-lower.

- Standard:**      Reads and circle slashes note

**Comment:**

**OST-1039 Section 7.2, Step 1**

- Performance Step: 5**      Prior to reading the value of detector current, VERIFY the meter range/rate switch is in the 400  $\mu$ A/SLOW position.

- Standard:**      Prior to reading the value of detector current, VERIFIES the Meter Range/Rate switch is in the 400  $\mu$ A/SLOW position.

<b>Evaluator Note:</b>	<b>This information is on the JPM Cue Sheet</b>
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**Comment:**

**OST-1039 Section 7.2, Step 2**

**Performance Step: 6** RECORD on Attachment 2, in column A, the upper and lower detector currents from all operable power range channels as read on the Nuclear Instrumentation Cabinet.

**Standard:** Transposes readings from PRNIS Readings Table onto Attachment 2.

**Comment:**

**OST-1039 Section 7.2, Step 3**

✓ **Performance Step: 7** RECORD on Attachment 2, in column B, the 100% power normalized current for each channel from Curve F-x-8.

**Standard:** Transposes TOP and BOTTOM 100% current values from the Curve Book provided.

**Comment:**

**OST-1039 Section 7.2, Note prior to Step 4**

**Performance Step: 8** NOTE: When recording all fractions and ratios, record to four decimal places, dropping the fifth and subsequent decimal places.

**Standard:** Reads and circle slashes note

**Comment:**

**OST-1039 Section 7.2, Step 4**

**Performance Step: 9** Divide values in Column A by the respective normalized current in Column B and record the result in Column C as the Normalized Fraction.

**Standard:** Divides each Upper and Lower reading by the respective 100% normalized current value and records in Column C.

**Comment:**

**OST-1039 Section 7.2, Step 5****Performance Step: 10**

CALCULATE the average value for the upper and the lower Normalized Fractions as follows:

- ADD the Normalized Fraction in each section of column C, recording the sum in the space provided.
- DIVIDE the sum obtained in Step 7.2.5.a by the number of operable NI channels, recording the result in column D of Attachment 2.

**Standard:**

Adds all Normalized Fractions for the same plane and records the sum in the space provided.

Divides by the sum by four and records result in Column D.

**Comment:****OST-1039 Section 7.2, Step 6****✓ Performance Step: 11**

Using the formula and values from Attachment 2, CALCULATE the Upper and Lower Ratios.

**Standard:**

- Divides the Maximum Normalized Fraction by the Average Normalized Fraction on each plane.
- Determines the UPPER ratio is  $\geq 1.02$

**Evaluator Note:**

The applicant may inform the CRS as soon as any calculation is  $> 1.02$ . If so, acknowledge and direct applicant to complete Attachment 2.

**Comment:****OST-1039 Section 7.2, Step 7****Performance Step: 12**

PERFORM independent verification of all calculations made on Attachment 2.

**Standard:**

Requests Independent Verifier.

**Evaluator Cue:**

If necessary, repeat Initiating Cue: For the purpose of this examination, there will be no independent verification of your work.

**Comment:**

Candidate may choose to check calculations.

**OST-1039 Section 7.2, Note prior to Step 8**

**Performance Step: 13** NOTE: The upper ratio or the lower ratio, whichever is greater, is the quadrant power tilt ratio (QPTR).

**Standard:** Reads and circle slashes note

**Comment:**

**OST-1039 Section 7.2, Step 8**

✓ **Performance Step: 14** RECORD QPTR:

**Standard:** Records QPTR value as 1.0902 to 1.0912 (N43 UPPER)  
Identifies Upper as outside the band

**Comment:** Acceptable band is +/- 5% (rounded to .0005).  
UPPER calculated band is 1.0902 to 1.0912  
LOWER calculated band is 1.0665 to 1.0675

**OST-1039 Section 7.2, Step 9**

✓ **Performance Step: 15** CHECK QPTR is less than or equal to 1.02.

**Standard:** Identifies Upper QPTR as greater than 1.02 and QPTR is unacceptable

**Comment:**

**OST-1039 Section 7.2, Note prior to Step 10**

**Performance Step: 16** NOTE: ERFIS turn on codes used to obtain ERFIS QPTR values include "QPTR" and "GD QPTR".

**Standard:** Reads and circle slashes note

**Comment:**

**OST-1039 Section 7.2, Step 10**

**Performance Step: 17** IF the ERFIS calculated QPTR value is available, THEN COMPARE OST-1039 results to the ERFIS QPTR calculated output as a quality check.

**Standard:** Request status of ERFIS calculated QPTR value, and N/A's step 7.2.10 when notified ERFIS QPTR is not available.

<b>Evaluator Note:</b>	<b>This information is on the JPM Cue Sheet</b>
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**Evaluator Cue:**

**Comment:**

**OST-1039 Section 7.2, Step 11**

**Performance Step: 18** IF any ERFIS QPTR quality codes do not have a good quality code or the higher of ANM9112U or ANM9113L do not approximate the value for QPTR determined above, THEN CONTACT HNP IT to investigate.

**Standard:** Request if notification of the status of the ERFIS calculated QPTR value to HNP IT has been completed.

<b>Evaluator Note:</b>	<b>This information is on the JPM Cue Sheet</b>
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**Evaluator Cue:**

**Comment:**



**OST-1039 Section 7.3, Test Completion Step 1**

- ✓ **Performance Step: 19**
- IF this test was performed due to an inoperable QPTR alarm, THEN DOCUMENT completion of PMID 22125 RQ 01.
  - COMPLETE applicable sections of Attachment 3, Certifications and Reviews.
  - INFORM the CRS this test is completed.

**Standard:**

- Check marks Periodic Surveillance or notes AOP-001 in Comments section
  - Plant Condition: 90% Power (may note dropped rod)
  - Mode 1
  - Today's Date
  - Current Time
  - OST Completed By: Applicant's name
  - Initials/Name
- ✓
- Indicate in General Comments Section and/or informs CRS that the limit is exceeded

**Evaluator Cue:** Acknowledge any report.

**Comment:**

<b>Terminating Cue:</b>	<b>After the CRS has been notified:</b>  <b>Evaluation on this JPM is complete.</b>
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**STOP Time:** \_\_\_\_\_.

**KEY**Record QPTR = **1.0907** Acceptable band is +/- 5% (rounded to .0005) 1.0902 to 1.0912CHECK QPTR is less than or equal to 1.02 (circle) YES / **NO**

UPPER DETECTOR	A	B	C	D
	UPPER DETECTOR CURRENT	UPPER 100% POWER NORMALIZED CURRENT	UPPER NORMALIZED FRACTION (NOTE 1)	AVERAGE UPPER NORMALIZED FRACTION
N-41	145.6	164.1	0.8872	0.8840
N-42	162.5	187.6	0.8662	
N-43	199.8	207.2	0.9642	
N-44	138.4	169.1	0.8184	
SUM			3.5360	

$$\text{Upper Ratio} = \frac{\text{Maximum Upper Normalized Fraction}}{\text{Average Upper Normalized Fraction}} = \frac{0.9642}{0.8840} = 1.0907^*$$

\* Standard for this calculation is 1.0902 to 1.0912

LOWER DETECTOR	A	B	C	D
	LOWER DETECTOR CURRENT	LOWER 100% POWER NORMALIZED CURRENT	LOWER NORMALIZED FRACTION (NOTE 1)	AVERAGE LOWER NORMALIZED FRACTION
N-41	159.6	183.0	0.8721	0.8729
N-42	172.1	200.4	0.8587	
N-43	209.3	224.7	0.9314	
N-44	165.2	199.1	0.8297	
SUM			3.4919	

$$\text{Lower Ratio} = \frac{\text{Maximum Lower Normalized Fraction}}{\text{Average Lower Normalized Fraction}} = \frac{0.9314}{0.8729} = 1.0670^{**}$$

\*\* Standard for this calculation is 1.0665 to 1.0675

✓ - Denotes Critical Steps

Job Performance Measure No.: 2013 NRC Exam Admin JPM RO A2  
Perform a Quadrant Power Tilt Ratio Surveillance

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Question:

Response:

Result: SAT \_\_\_\_\_ UNSAT \_\_\_\_\_

Examiner's Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Name: \_\_\_\_\_

Date: \_\_\_\_\_

**Initial Conditions:**

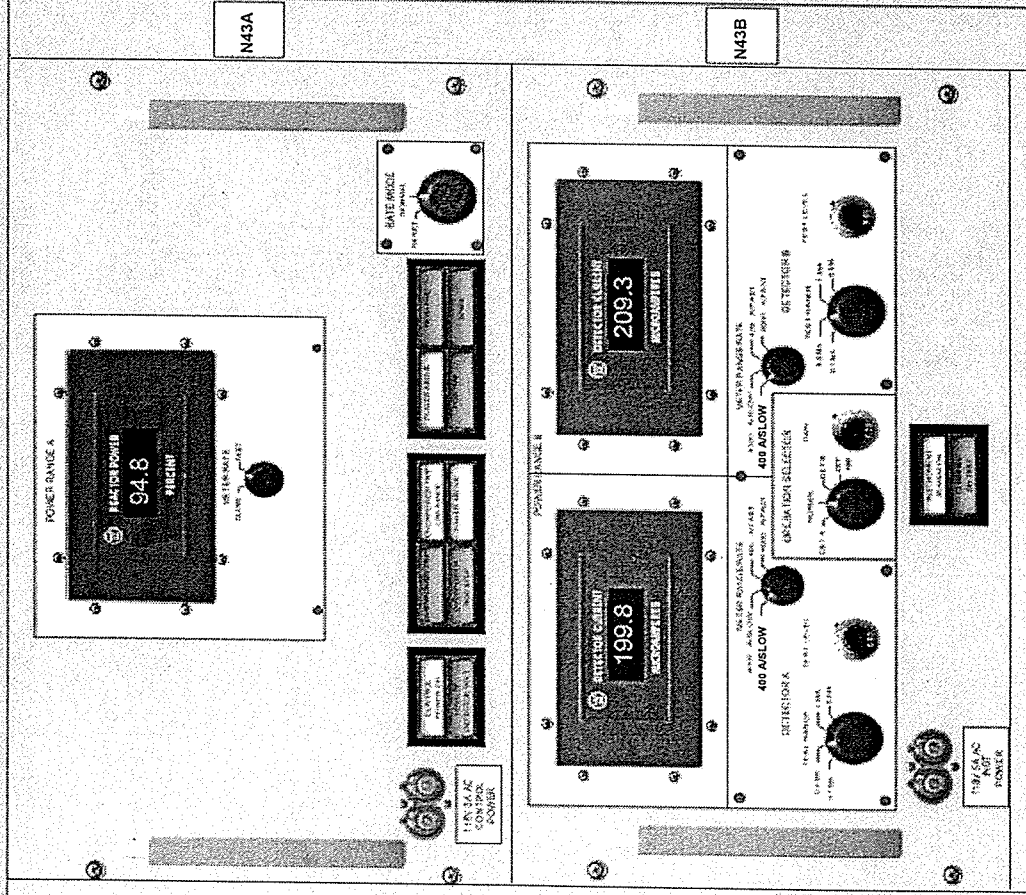
- The plant is operating at 90% power when a rod in Control Bank 'A' (P-10) dropped.
- The crew is performing AOP-001, MALFUNCTION OF ROD CONTROL AND INDICATION SYSTEM.
- There are NO deficiency tags on PR NIs.
- ERFIS points ANM9112U and ANM9113L have a BAD quality code. HNP IT has been notified and they are evaluating the ERFIS points.

**Initiating Cue:**

The CRS has directed you to perform a manual QPTR IAW OST-1039, CALCULATION OF QPTR. The Power Range NIS indications are provided.

**For the purposes of the examination, there will be no independent verification. Show values of your work.**



**nghouse**NUCLEAR INSTRUMENTATION  
PROTECTION CHANNEL IIINUCLEAR INSTRUMENTATION  
PROTECTION CHANNEL IV

Current and Voltage Setpoints Table  
(100% Power, 0% Incore Axial Offset)

Channel #	Top Current ( $\mu$ A)	Bottom Current ( $\mu$ A)
N41	164.1	183.0
N42	187.6	200.4
N43	207.2	224.7
N44	169.1	199.1

Curve No.	F-18-8	Rev. 6
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Facility: Shearon Harris Task No.: 119015H301  
Task Title: Determine Active / Inactive Status Of Off Shift License Personnel JPM No.: 2013 NRC Admin JPM RO SRO A1-1

K/A Reference: G2.1.1 3.8 / 4.2 Alternate Path: No

Examinee: \_\_\_\_\_ NRC Examiner: \_\_\_\_\_

Facility Evaluator: \_\_\_\_\_ Date: \_\_\_\_\_

Method of testing:

Simulated Performance: \_\_\_\_\_ Actual Performance: X  
Classroom X Simulator \_\_\_\_\_ Plant \_\_\_\_\_

**READ TO THE EXAMINEE**

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

**Initial Conditions:**

The plant was at 100% power, when the OAC has a medical emergency and will not be able to work his next scheduled shift. The Operations Resource Scheduler has contacted four off shift individuals to replace the OAC on the following day.

**Initiating Cue:**

You are to determine if each of the Licensed Operators is eligible to work the OAC position on the 0700 - 1900 shift on September 13, 2013.



Task Standard: Determines the Training Department Rotation of Assignment and Work Control Operator license are Active and eligible to stand the 0700 - 1900 shift on September 13, 2013

Required Materials: Calculator

General References: OMM-001, rev 98

Handouts: JPM Cue Sheets Pages 7 - 8

Time Critical Task: No

Validation Time: 15 minutes

Critical Task Justification	
Step 2	Must determine the Active / Inactive status of Operator license correctly or an ineligible Operator may stand watch
Step 3	Must determine the Active / Inactive status of Operator license correctly or an ineligible Operator may stand watch
Step 4	Must determine the Active / Inactive status of Operator license correctly or an ineligible Operator may stand watch
Step 5	Must determine the Active / Inactive status of Operator license correctly or an ineligible Operator may stand watch

Start Time: \_\_\_\_\_.

**Performance Step: 1**      OBTAIN PROCEDURE**Standard:**                      Obtains OMM-001 and refers to Section 5.5 Maintenance of NRC Operator Licenses.**Comment:**✓ **Performance Step: 2**      Determine if the Active / Inactive status of FIN Team Operator license**Standard:**                      Candidate determines the license is Inactive and **NOT ELIGIBLE** because the operator did not work the required 5 twelve hour shifts in a license position during the previous quarter.**Comment:**✓ **Performance Step: 3**      Determine if the Active / Inactive status of Train Department Rotation of Assignment Operator license**Standard:**                      Candidate determines the license is Active and **ELIGIBLE** because the license was reactivated in the previous quarter. There is not a requirement to complete the normally required 5 twelve hour shifts in a license position during the quarter. *(i.e. could complete the reactivation during the last week of a quarter, thus the opportunity would not be available to work the 5 shifts)***Comment:**

- ✓ **Performance Step: 4** Determine if the Active / Inactive status of Work Control Operator license

**Standard:** Candidate determines the license is Active and ELIGIBLE because the operator worked the required 5 twelve hour shifts in a license position during the previous quarter.

**Comment:**

- ✓ **Performance Step: 5** Determine if the Active / Inactive status of Procedure Writer's Group Operator license

**Standard:** Candidate determines the license is Inactive and NOT ELIGIBLE because a required license position was NOT reactivated in the previous quarter AND the individual did not work the required 5 twelve hour shifts in a license position during the quarter. *(i.e. STA position is not an on shift position that is credited for a license operator watch)*

**Comment:**

- Performance Step: 6** Determines the licensed operators eligible to stand the 0700 - 1900 shift on September 13, 2013

**Standard:** Determines the Training Department Rotation of Assignment and Work Control Operator license are Active and eligible to stand the 0700 - 1900 shift on September 13, 2013

<b>Evaluator Cue:</b>	<b>CRS acknowledges determination of eligible watch standers END OF JPM</b>
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**Comment:**

**Stop Time:** \_\_\_\_\_

**KEY**

Four Reactor Operators have the following history:

- All four are current in License Operator Requalification Training and have had a medical examination in the past 2 years.
- None of the 4 have worked any shift since 06/30/13.
- Active/Inactive status and time on shift since April 1, 2013 is as follows for each of the

Reactor Operators:

- FIN Team Operator License was active on April 1, 2013
  - 4/02/13 - worked 0700-1900 shift as OAC
  - 4/03/13 - worked 0700-1900 shift as BOP
  - 5/04/13 - worked 0700-1900 shift as CRS
  - 6/14/13 - worked 0700-1900 shift as STA
  - 6/17/13 - worked 1900-0700 shift as CRS
- Training Department Rotation of Assignment Operator License was inactive on April 1, 2013
  - 5/02/13 thru 5/06/13 worked 40 hours under the direction of the OAC and completed all requirements for reactivation.**
  - 5/10/13 - worked 0700-1900 shift as BOP
  - 5/12/13 - worked 0700-1900 shift as OAC
  - 5/14/13 - worked 1900-0700 shift as OAC
  - 5/31/13 - worked 1900-0700 shift as BOP
- Work Control Operator License was active on April 1, 2013
  - 4/23/13 - worked 0700-1900 shift as OAC**
  - 4/25/13 - worked 0700-1900 shift as BOP**
  - 5/05/13 - worked 0700-1900 shift as OAC**
  - 5/14/13 - worked 1900-0700 shift as BOP**
  - 6/17/13 - worked 1900-0700 shift as OAC**
- Procedure Writer's Group Operator License was active on April 1, 2013 4/12/13 thru 4/16/13 worked 40 hours under the direction of the STA and completed all requirements for reactivation.
  - 4/14/13 - worked 1900-0700 shift as STA
  - 4/18/13 - worked 0700-1900 shift as STA
  - 5/12/13 - worked 0700-1900 shift as OAC
  - 5/14/13 - worked 1900-0700 shift as BOP
  - 5/31/13 - worked 1900-0700 shift as CRS

To maintain active status, licensed individuals shall actively perform the functions of an operator or senior operator on a minimum of five 12-hour shifts per calendar quarter.

OR

A minimum of 40 hours of shift functions under the direction of an operator or senior operator as appropriate and in the position to which the individual will be assigned. The 40 hours must have included a complete review of all required shift turnover procedures.

**KEY**

1. FIN Team Operator.....ELIGIBLE / **NOT ELIGIBLE**
2. Training Department Rotation of Assignment Operator....**ELIGIBLE** / NOT ELIGIBLE
3. Work Control Operator.....**ELIGIBLE** / NOT ELIGIBLE
4. Procedure Writer's Group Operator.....ELIGIBLE / **NOT ELIGIBLE**

Job Performance Measure No.: 2013 NRC JPM RO SRO A1-1

Determine Active / Inactive Status Of Off Shift License  
Personnel

OMM-001

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Question:

Response:

Result: SAT \_\_\_\_\_ UNSAT \_\_\_\_\_

Examiner's Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Name: \_\_\_\_\_

Date: \_\_\_\_\_

<b>Initial Conditions:</b>	The plant was at 100% power, when the OAC has a medical emergency and will not be able to work his next scheduled shift. The Operations Resource Scheduler has contacted four off shift individuals to replace the OAC on the following day.
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<b>Initiating Cue:</b>	You are to determine if each of the Licensed Operators is eligible to work the OAC position on the 0700 - 1900 shift on September 13, 2013.
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After making the determination of License Operator eligibility circle their status below:

1. FIN Team Operator.....ELIGIBLE / NOT ELIGIBLE
2. Training Department Rotation of Assignment Operator.....ELIGIBLE / NOT ELIGIBLE
3. Work Control Operator.....ELIGIBLE / NOT ELIGIBLE
4. Procedure Writer's Group Operator.....ELIGIBLE / NOT ELIGIBLE

Four Reactor Operators have the following history:

- All four are current in License Operator Requalification Training and have had a medical examination in the past 2 years.
- None of the 4 have worked any shift since 06/30/13.
- Active/Inactive status and time on shift since April 1, 2013 is as follows for each of the

Reactor Operators:

- FIN Team Operator License was active on April 1, 2013
  - 4/02/13 - worked 0700-1900 shift as OAC
  - 4/03/13 - worked 0700-1900 shift as BOP
  - 5/04/13 - worked 0700-1900 shift as CRS
  - 6/14/13 - worked 0700-1900 shift as STA
  - 6/17/13 - worked 1900-0700 shift as CRS
- Training Department Rotation of Assignment Operator License was inactive on April 1, 2013
  - 5/02/13 thru 5/06/13 worked 40 hours under the direction of the OAC and completed all requirements for reactivation.
  - 5/10/13 - worked 0700-1900 shift as BOP
  - 5/12/13 - worked 0700-1900 shift as OAC
  - 5/14/13 - worked 1900-0700 shift as OAC
  - 5/31/13 - worked 1900-0700 shift as BOP
- Work Control Operator License was active on April 1, 2013
  - 4/23/13 - worked 0700-1900 shift as OAC
  - 4/25/13 - worked 0700-1900 shift as BOP
  - 5/05/13 - worked 0700-1900 shift as OAC
  - 5/14/13 - worked 1900-0700 shift as BOP
  - 6/17/13 - worked 1900-0700 shift as OAC
- Procedure Writer's Group Operator License was active on April 1, 2013 4/12/13 thru 4/16/13 worked 40 hours under the direction of the STA and completed all requirements for reactivation.
  - 4/14/13 - worked 1900-0700 shift as STA
  - 4/18/13 - worked 0700-1900 shift as STA
  - 5/12/13 - worked 0700-1900 shift as OAC
  - 5/14/13 - worked 1900-0700 shift as BOP
  - 5/31/13 - worked 1900-0700 shift as CRS



Facility: HARRIS Task No.: 301179H601  
Task Title: Determine Average RCS Boron Concentration JPM No.: 2013 NRC Admin  
JPM RO SRO A1-2

K/A Reference: 004 A4.04 3.2 / 3.6 Alternate Path: No

Examinee: \_\_\_\_\_ NRC Examiner: \_\_\_\_\_

Facility Evaluator: \_\_\_\_\_ Date: \_\_\_\_\_

Method of testing:

Simulated Performance: \_\_\_\_\_ Actual Performance: X  
Classroom X Simulator \_\_\_\_\_ Plant \_\_\_\_\_

**READ TO THE EXAMINEE**

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

**Initial Conditions:**

Following a loss of offsite power, recovery actions are being taken in accordance with EOP-ECA-0.1, Loss of All AC Power Recovery Without SI Required

Plant conditions are as follows:

- PRZ pressure 2230 psig
- RCS Hot Leg temperatures 555°F
- Core Exit thermocouples 560°F
- PRZ Liquid space temperature 650°F
- PRZ Steam space temperature 650°F
- PRZ level 45 %
- Charging and letdown are in service, with letdown flow at 45 gpm.

Chemistry has just taken RCS boron samples and reports the following results:

- Loop 'B' Hot Leg 930 ppm
- Loop 'C' Hot Leg 940 ppm
- PRZ Liquid Space 961 ppm

**Initiating Cue:**

The CRS requires that you calculate the average RCS boron concentration for these conditions per EOP-ECA-0.1, Attachment 1 to TWO decimal places.

rev'd  
7/8/13

Task Standard: Average RCS boron calculation determined to be  $937.4 \pm 0.5$  ppm.

Required Materials:

- Calculator
- Curve Book

General References:

- EOP-ECA-0.1, Loss of All AC Power Recovery Without SI Required, Rev. 0
- Curve D-X-40, Pressurizer Volume

Handouts:

- JPM Cue Sheets
- EOP-ECA-0.1, Loss of All AC Power Recovery Without SI Required, Rev. 0 Attachment 1
- Curve Book (preferred) or at a minimum Curve D-X-40

Time Critical Task: No

Validation Time: 15 minutes

Start Time: \_\_\_\_\_.

**Performance Step: 1**      Locate ECA-0.1, Attachment 1, and Curve Book  
(Attachment 1 provided with handout)

**Standard:**                      Obtains ECA-0.1, Attachment 1, and Curve Book

**Comment:**

ECA-0.1, Att. 1, Step 1

**Performance Step: 2**      Record PRZ level at the time of PRZ sample

**Standard:**                      Records PRZ level as 45%

**Comment:**

ECA-0.1, Att. 1, Step 2

✓ **Performance Step: 3**      Determine PRZ volume ( $V_{PRZ}$ ) based on PRZ level and  
curve D-X-40

**Standard:**

- References curve D-X-40
- Determines intersection of "653°F PRZ LIQUID SPACE TEMP LINE" and 45% on "INDICATED PRESSURIZER LEVEL" axis (X) to correspond to  $2900 \pm 100$  gallons on "VOLUME" axis (Y)

**Comment:**

- ECA-0.1, Att. 1, Step 3
- ✓ **Performance Step: 4** Determine CVCS volume ( $V_{CVCS}$ ) based on letdown status:
- If letdown in service =  $2136 \text{ gal} \div 2 = 1068 \text{ gal}$
  - If letdown isolated = 0

**Standard:** Determines letdown volume of 1068 gallons due to letdown being in service

**Comment:**

- ECA-0.1, Att. 1, Step 4
- Performance Step: 5** Record RCS loop B boron concentration  $C_2$

**Standard:** Records RCS loop B boron concentration as 930 ppm

**Comment:**

- ECA-0.1, Att. 1, Step 5
- Performance Step: 6** Record RCS loop C boron concentration  $C_3$

**Standard:** Records RCS loop C boron concentration as 940 ppm

**Comment:**

- ECA-0.1, Att. 1, Step 6
- Performance Step: 7** Record PRZ liquid space boron concentration  $C_{PRZ}$

**Standard:** Records PRZ liquid space boron concentration as 961 ppm

**Comment:**

ECA-0.1, Att. 1, Step 7

**Performance Step: 6**Calculate average RCS boron concentration ( $C_{AVG}$ ) using the following formula (formula on Att. 1, Step 7)**Standard:**Calculates average RCS boron concentration to be  $937.42 \pm 0.5$  ppm. (Range 936.92 - 937.92 ppm)**Evaluator Note:****NOTE: ALLOWED TOLERANCE BORDERS TOLERANCE FOR ALLOWED ERROR IN READING CURVE D-X-40, BUT WILL NOT BE MET IF APPLICANT FAILS TO ACCOUNT FOR CVCS LETDOWN OR OTHER SIMILAR ERRORS.****Comment:****Evaluator Cue:****When boration calculation completed  
END OF JPM****Stop Time:** \_\_\_\_\_**Terminating Cue:**

Calculation of average boration concentration completed.

## KEY

## LOSS OF ALL AC POWER RECOVERY WITHOUT SI REQUIRED

Attachment 1

Sheet 1 of 1

## CALCULATION FOR AVERAGE RCS BORON CONCENTRATION

1. Record PRZ level at the time of PRZ sample: 45 %
  2. Determine PRZ volume ( $V_{PRZ}$ ) based on PRZ level and curve D-X-40: 2900 ± 100 GAL
  3. Determine CVCS volume ( $V_{CVCS}$ ) based on letdown status: 1068 GAL
    - If letdown in service = 2136 GAL ÷ 2 = 1068 GAL
    - If letdown isolated = 0 GAL
  4. Record RCS loop B boron concentration  $C_2$ : 930 PPM
  5. Record RCS loop C boron concentration  $C_3$ : 940 PPM
  6. Record PRZ liquid space boron concentration  $C_{PRZ}$ : 961 PPM
  7. Calculate average RCS boron concentration ( $C_{avg}$ ) using the following formula:
- $$C_{avg} = \frac{[(930 + 940) \times (31218 + 1068)] + [961 \times (2900 + 3700)]}{[(C_2 + C_3) \times (31218 + V_{CVCS})] + [C_{PRZ} \times (V_{PRZ} + 3700)]} = \frac{(2900 + 2 \times (1068) + 66135)}{(2900 + 2 \times (1068) + 66135)} = 937.42 \text{ PPM}$$

NOTE 1: RCS Volume not including PRZ, Upper Head, Surge Line or CVCS = 62,435 GAL.  
(Value halved in calculation to account for averaging the boron concentration for Loops B and C = 31,218 GAL.)

NOTE 2: RCS Volume not including PRZ or CVCS = 66,135 GAL.

NOTE 3: Combined Upper Head and Surge Line Volume = 3700 GAL.  
(Upper Head Volume = 3365 GAL and Surge Line Volume = 335 GAL.)

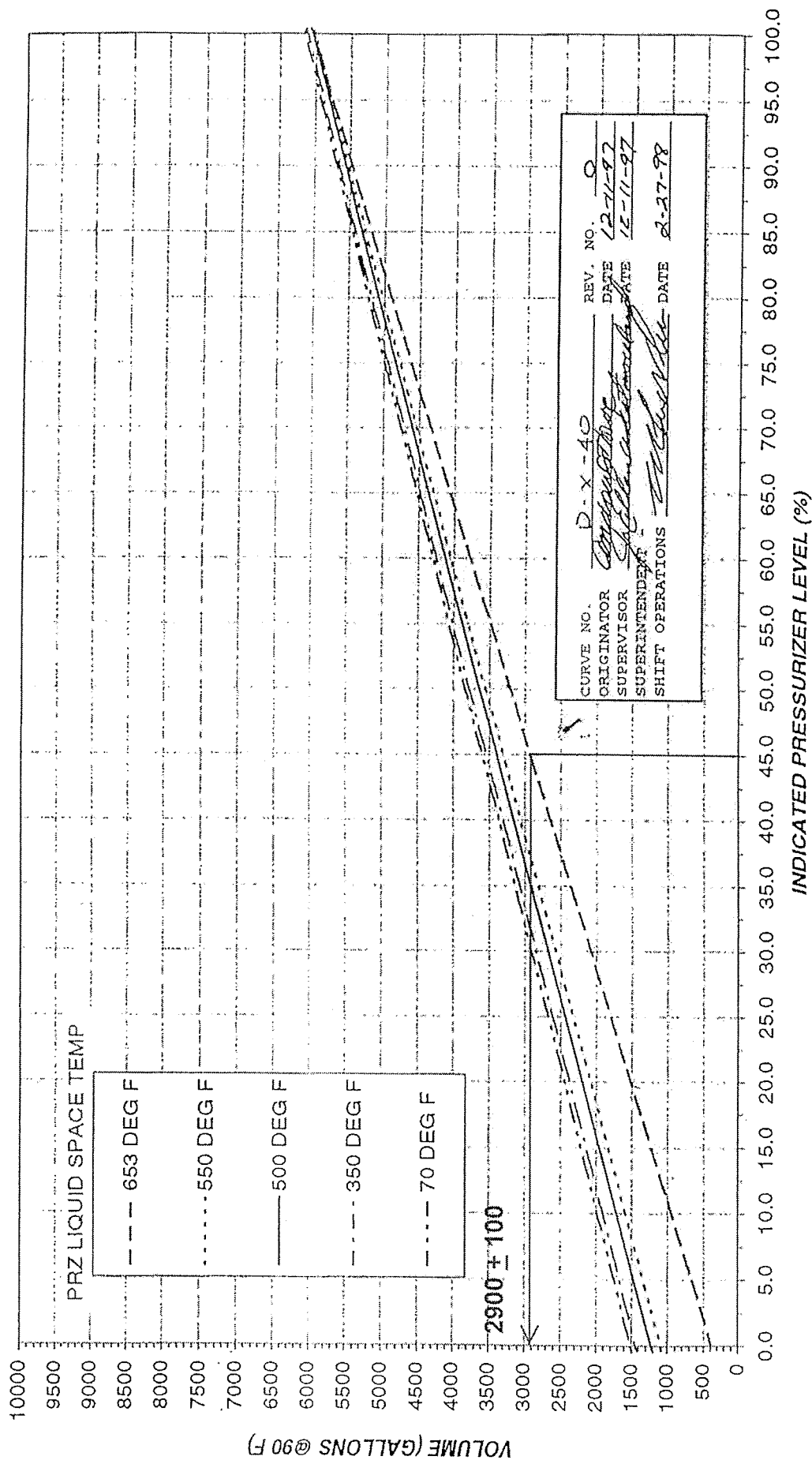
NOTE 4: CVCS Volume = 2136 GAL (Value halved in Step 3 to account for averaging the boron concentration for RCS loop B and C = 1068 GAL.)

NOTE 5: The boron concentration of the Upper Head and Surge Line is assumed to be that of the PRZ since these volumes also stagnate when RCPs are lost. CVCS boron concentration is assumed to be that of the RCS.

## PERFORMANCE INFORMATION

## KEY

## PRESSURIZER VOLUME (LT-459, LT-460, AND LT-461)



Job Performance Measure No.: 2013 NRC Exam Admin JPM RO SRO A1-2  
Determine Average RCS Boron Concentration

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Question:

Response:

Result: SAT \_\_\_\_\_ UNSAT \_\_\_\_\_

Examiner's Signature: \_\_\_\_\_ Date: \_\_\_\_\_



<b>Initial Conditions:</b>	<p>Following a loss of offsite power, recovery actions are being taken in accordance with EOP-ECA-0.1, Loss of All AC Power Recovery Without SI Required</p> <p>Plant conditions are as follows:</p> <ul style="list-style-type: none"><li>• PRZ pressure 2230 psig</li><li>• RCS Hot Leg temperatures 555°F</li><li>• Core Exit thermocouples 560°F</li><li>• PRZ Liquid space temperature 650°F</li><li>• PRZ Steam space temperature 650°F</li><li>• PRZ level 45 %</li><li>• Charging and letdown are in service, with letdown flow at 45 gpm.</li></ul> <p>Chemistry has just taken RCS boron samples and reports the following results:</p> <ul style="list-style-type: none"><li>• Loop 'B' Hot Leg 930 ppm</li><li>• Loop 'C' Hot Leg 940 ppm</li><li>• PRZ Liquid Space 961 ppm</li></ul>
<b>Initiating Cue:</b>	<p>The CRS requires that you calculate the average RCS boron concentration for these conditions per EOP-ECA-0.1, Attachment 1 to TWO decimal places.</p>

Facility: Shearon Harris Task No.: 015004H201  
 Task Title: Perform the Quadrant Power Tilt Ratio Surveillance JPM No.: 2013 NRC Exam Admin JPM SRO A2

K/A Reference: G2.2.12 RO 3.7 SRO 4.1 **Alternate Path: No**

Examinee: \_\_\_\_\_ NRC Examiner: \_\_\_\_\_

Facility Evaluator: \_\_\_\_\_ Date: \_\_\_\_\_

Method of testing:

Simulated Performance: \_\_\_\_\_ Actual Performance: X  
 Classroom X Simulator \_\_\_\_\_ Plant \_\_\_\_\_

**READ TO THE EXAMINEE**

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

**Initial Conditions:**

- The plant is operating at 90% power when a rod in Control Bank 'A' (P-10) dropped.
- The crew is performing AOP-001, MALFUNCTION OF ROD CONTROL AND INDICATION SYSTEM.
- There are NO deficiency tags on PR NIs.
- ERFIS points ANM9112U and ANM9113L have a BAD quality code. HNP IT has been notified and they are evaluating the ERFIS points.

**Initiating Cue:**

The CRS has directed you to perform a manual QPTR IAW OST-1039, CALCULATION OF QPTR, AND evaluate the actions, if any, of the applicable Technical Specification. The Power Range NIS indications are provided.

**For the purposes of the examination, there will be no independent verification. Show values of your work.**

Task Standard: Calculations within required band.  
Correct Tech Spec actions are identified.

Required Materials: Calculator

General References: OST-1039, CALCULATION OF QPTR, Revision 16  
Technical Specifications

Handouts:

- OST-1039
- Power Range NI – Current and Voltage Set point Table
- Technical Specifications

Time Critical Task: No

Validation Time: 15 minutes

Critical Step Justification	
<b>Step 11</b>	Must accurately determine the correct calculation based on collecting and inputting either provided data or visual inspection data. The calculation will yield an unsatisfactory QPTR.
<b>Step 14</b>	Must identify that the QPTR upper is outside the band which will make this overall results unsatisfactory.
<b>Step 15</b>	Must unsatisfactory that the QPTR is greater than 1.02 (which is a Tech Spec limit).
<b>Step 19</b>	Must correctly identify through documentation that the QPTR limits are exceeded.
<b>Step 20</b>	Must accurately identify associated Technical Specifications with a QPTR that has exceeded the limits specified in HNP Technical Specifications.

**Start Time:** \_\_\_\_\_.**Performance Step: 1** Obtain procedure.**Standard:** Reviews procedure.

<b>Evaluator Cue:</b>	<b>Provide OST-1039.</b>
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**Evaluator Note:** A KEY is provided for your use on JPM prior to candidate pages.**Comment:**

<b>Evaluator Note:</b>	<b>NOTE: The NI curve numbers provided in this JPM are numbers from the 2013 NRC Exam Frozen Procedures Curve Book folder.</b>
------------------------	--

**Procedure Note:**

Precaution and Limitation 4.0.1 has guidance if performing this OST with one Power Range Channel inoperable.

**Performance Step: 2**

Completes Prerequisites section:

- Verify instrumentation needed for the performance of this test is free of deficiencies that affect instrument indication.
- Verify the most recent Curve F-X-8 is used in the performance of this procedure. (Reference 2.1.1 and 2.1.2)
- OBTAIN CRS permission to perform this OST.

**Standard:**

- Logs F-18-8 revision number : 6
- Initials/signs all blocks

**Comment:**

- Performance Step: 3**
- IF Quadrant Power Tilt Ratio Calculation Computer Program is used, THEN PERFORM the following:
    - MARK Step 7.0.2 N/A.
    - MARK Section 7.2 N/A.
    - PERFORM Section 7.1.
  - IF manual calculation of the Quadrant Power Tilt Ratio is used, THEN PERFORM the following:
    - MARK Section 7.1 N/A.
    - PERFORM Section 7.2.

- Standard:**
- Marks Section 7.1 N/A
  - Proceeds to Section 7.2

**Comment:**

**OST-1039 Section 7.2 Note prior to step 1**

- Performance Step: 4**      **NOTE: The detector current meters on each power range channel drawer are designated as left-upper, right-lower.**

- Standard:**      Reads and circle slashes note

**Comment:**

**OST-1039 Section 7.2, Step 1**

- Performance Step: 5**      Prior to reading the value of detector current, VERIFY the meter range/rate switch is in the 400  $\mu$ A/SLOW position.

- Standard:**      Prior to reading the value of detector current, VERIFIES the Meter Range/Rate switch is in the 400  $\mu$ A/SLOW position.

**Evaluator Note:**

**This information is on the JPM Cue Sheet**

**Comment:**

**Performance Step: 6** **OST-1039 Section 7.2, Step 2**  
RECORD on Attachment 2, in column A, the upper and lower detector currents from all operable power range channels as read on the Nuclear Instrumentation Cabinet.

**Standard:** Transposes readings from PRNIS Readings Table onto Attachment 2.

**Comment:**

✓ **Performance Step: 7** **OST-1039 Section 7.2, Step 3**  
RECORD on Attachment 2, in column B, the 100% power normalized current for each channel from Curve F-x-8.

**Standard:** Transposes TOP and BOTTOM 100% current values from the Curve Book provided.

**Comment:**

**Performance Step: 8** **OST-1039 Section 7.2, Note prior to Step 4**  
NOTE: When recording all fractions and ratios, record to four decimal places, dropping the fifth and subsequent decimal places.

**Standard:** Reads and circle slashes note

**Comment:**

**Performance Step: 9** **OST-1039 Section 7.2, Step 4**  
Divide values in Column A by the respective normalized current in Column B and record the result in Column C as the Normalized Fraction.

**Standard:** Divides each Upper and Lower reading by the respective 100% normalized current value and records in Column C.

**Comment:**

**OST-1039 Section 7.2, Step 5****Performance Step: 10**

CALCULATE the average value for the upper and the lower Normalized Fractions as follows:

- ADD the Normalized Fraction in each section of column C, recording the sum in the space provided.
- DIVIDE the sum obtained in Step 7.2.5.a by the number of operable NI channels, recording the result in column D of Attachment 2.

**Standard:**

Adds all Normalized Fractions for the same plane and records the sum in the space provided.

Divides by the sum by four and records result in Column D.

**Comment:****OST-1039 Section 7.2, Step 6**✓ **Performance Step: 11**

Using the formula and values from Attachment 2, CALCULATE the Upper and Lower Ratios.

**Standard:**

- Divides the Maximum Normalized Fraction by the Average Normalized Fraction on each plane.
- Determines the UPPER ratio is  $\geq 1.02$

<b>Evaluator Note:</b>	<b>The applicant may inform the CRS as soon as any calculation is <math>&gt; 1.02</math>. If so, acknowledge and direct applicant to complete Attachment 2.</b>
------------------------	---

**Comment:****OST-1039 Section 7.2, Step 7****Performance Step: 12**

PERFORM independent verification of all calculations made on Attachment 2.

**Standard:**

Requests Independent Verifier.

**Evaluator Cue:**

If necessary, repeat Initiating Cue: For the purpose of this examination, there will be no independent verification of your work.

**Comment:**

Candidate may choose to check calculations.

**OST-1039 Section 7.2, Note prior to Step 8**

**Performance Step: 13** NOTE: The upper ratio or the lower ratio, whichever is greater, is the quadrant power tilt ratio (QPTR).

**Standard:** Reads and circle slashes note

**Comment:**

**OST-1039 Section 7.2, Step 8**

✓ **Performance Step: 14** RECORD QPTR:

**Standard:** Records QPTR value as 1.0902 to 1.0912 (N43 UPPER)  
Identifies Upper as outside the band

**Comment:** Acceptable band is +/- 5% (rounded to .0005).  
UPPER calculated band is 1.0902 to 1.0912  
LOWER calculated band is 1.0665 to 1.0675

**OST-1039 Section 7.2, Step 9**

✓ **Performance Step: 15** CHECK QPTR is less than or equal to 1.02.

**Standard:** Identifies Upper QPTR as greater than 1.02 and QPTR is unacceptable

**Comment:**

**OST-1039 Section 7.2, Note prior to Step 10**

**Performance Step: 16** NOTE: ERFIS turn on codes used to obtain ERFIS QPTR values include "QPTR" and "GD QPTR".

**Standard:** Reads and circle slashes note

**Comment:**



**OST-1039 Section 7.2, Step 10**

**Performance Step: 17** IF the ERFIS calculated QPTR value is available, THEN COMPARE OST-1039 results to the ERFIS QPTR calculated output as a quality check.

**Standard:** Request status of ERFIS calculated QPTR value, and N/A's step 7.2.10 when notified ERFIS QPTR is not available.

<b>Evaluator Note:</b>	<b>This information is on the JPM Cue Sheet</b>
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**Evaluator Cue:**

**Comment:**

**OST-1039 Section 7.2, Step 11**

**Performance Step: 18** IF any ERFIS QPTR quality codes do not have a good quality code or the higher of ANM9112U or ANM9113L do not approximate the value for QPTR determined above, THEN CONTACT HNP IT to investigate.

**Standard:** Request if notification of the status of the ERFIS calculated QPTR value to HNP IT has been completed.

<b>Evaluator Note:</b>	<b>This information is on the JPM Cue Sheet</b>
------------------------	---

**Evaluator Cue:**

**Comment:**

**OST-1039 Section 7.3, Test Completion Step 1**

- ✓ **Performance Step: 19**
- IF this test was performed due to an inoperable QPTR alarm, THEN DOCUMENT completion of PMID 22125 RQ 01.
  - COMPLETE applicable sections of Attachment 3, Certifications and Reviews.
  - INFORM the CRS this test is completed.

**Standard:**

- Check marks Periodic Surveillance or notes AOP-001 in Comments section
  - Plant Condition: 90% Power (may note dropped rod)
  - Mode 1
  - Today's Date
  - Current Time
  - OST Completed By: Applicant's name
  - Initials/Name
- ✓
- Indicate in General Comments Section and/or informs CRS that the limit is exceeded

**Evaluator Cue:****Acknowledge any report.****Comment:**

- ✓ **Performance Step: 20** Identify the Technical Specification LCOs that would be in effect.

**Standard:**

Identifies that Technical Specification 3.2.4, Quadrant Power Tilt Ratio has been exceeded

- Identifies the following ACTION statements to be implemented and the required time limitation (see page 12)
  - 3.2.4.b.1 1 hour
  - 3.2.4.b.2 30 minutes, reduce thermal power to  $\leq 73\%$ 
    - $(9\% \times 3\% = 27\% \quad 100\% - 27\% = 73\%)$
  - 3.2.4.b.3 2 hours

**Evaluator Note:**

Technical Specification 3.2.4.b.4 is not required to be identified since no direction is provided in the cue for raising thermal power.

**Comment:**

<b>Terminating Cue:</b>	<b>After the CRS has been notified:</b>  <b>Evaluation on this JPM is complete.</b>
-------------------------	---

**STOP Time:** \_\_\_\_\_.

**KEY**Record QPTR = **1.0907** Acceptable band is +/- 5% (rounded to .0005) 1.0902 to 1.0912CHECK QPTR is less than or equal to 1.02 (circle) YES / **NO**

	A	B	C	D
UPPER DETECTOR	UPPER DETECTOR CURRENT	UPPER 100% POWER NORMALIZED CURRENT	UPPER NORMALIZED FRACTION (NOTE 1)	AVERAGE UPPER NORMALIZED FRACTION
N-41	145.6	164.1	0.8872	0.8840
N-42	162.5	187.6	0.8662	
N-43	199.8	207.2	0.9642	
N-44	138.4	169.1	0.8184	
SUM			3.5360	

$$\text{Upper Ratio} = \frac{\text{Maximum Upper Normalized Fraction}}{\text{Average Upper Normalized Fraction}} = \frac{0.9642}{0.8840} = 1.0907^*$$

\* Standard for this calculation is 1.0902 to 1.0912

	A	B	C	D
LOWER DETECTOR	LOWER DETECTOR CURRENT	LOWER 100% POWER NORMALIZED CURRENT	LOWER NORMALIZED FRACTION (NOTE 1)	AVERAGE LOWER NORMALIZED FRACTION
N-41	159.6	183.0	0.8721	0.8729
N-42	172.1	200.4	0.8587	
N-43	209.3	224.7	0.9314	
N-44	165.2	199.1	0.8297	
SUM			3.4919	

$$\text{Lower Ratio} = \frac{\text{Maximum Lower Normalized Fraction}}{\text{Average Lower Normalized Fraction}} = \frac{0.9314}{0.8729} = 1.0670^{**}$$

\*\* Standard for this calculation is 1.0665 to 1.0675

✓ - Denotes Critical Steps

## KEY

POWER DISTRIBUTION LIMITSLIMITING CONDITION FOR OPERATIONACTION (Continued):

- b. With the QUADRANT POWER TILT RATIO determined to exceed 1.09 due to misalignment of either a shutdown or control rod:
1. Calculate the QUADRANT POWER TILT RATIO at least once per hour until either:
    - a) The QUADRANT POWER TILT RATIO is reduced to within its limit, or
    - b) THERMAL POWER is reduced to less than 50% of RATED THERMAL POWER.
  2. Reduce THERMAL POWER at least 3% from RATED THERMAL POWER for each 1% of indicated QUADRANT POWER TILT RATIO in excess of 1.00, within 30 minutes;
  3. Verify that the QUADRANT POWER TILT RATIO is within its limit within 2 hours after exceeding the limit or reduce THERMAL POWER to less than 50% of RATED THERMAL POWER within the next 2 hours and reduce the Power Range Neutron Flux-High Trip Setpoints to less than or equal to 55% of RATED THERMAL POWER within the next 4 hours; and
  4. Identify and correct the cause of the out-of-limit condition prior to increasing THERMAL POWER; subsequent POWER OPERATION above 50% of RATED THERMAL POWER may proceed provided that the QUADRANT POWER TILT RATIO is verified within its limit at least once per hour for 12 hours or until verified acceptable at 95% or greater RATED THERMAL POWER.
- c. With the QUADRANT POWER TILT RATIO determined to exceed 1.09 due to causes other than the misalignment of either a shutdown or control rod:
1. Calculate the QUADRANT POWER TILT RATIO at least once per hour until either:
    - a) The QUADRANT POWER TILT RATIO is reduced to within its limit, or
    - b) THERMAL POWER is reduced to less than 50% of RATED THERMAL POWER.

Job Performance Measure No.: 2013 NRC Exam Admin JPM RO A2  
Perform a Quadrant Power Tilt Ratio Surveillance

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Question:

Response:

Result: SAT \_\_\_\_\_ UNSAT \_\_\_\_\_

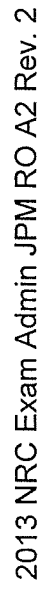
Examiner's Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Name: \_\_\_\_\_

Date: \_\_\_\_\_

<b>Initial Conditions:</b>	<ul style="list-style-type: none"><li>• The plant is operating at 90% power when a rod in Control Bank 'A' (P-10) dropped.</li><li>• The crew is performing AOP-001, MALFUNCTION OF ROD CONTROL AND INDICATION SYSTEM.</li><li>• There are NO deficiency tags on PR NIs.</li><li>• ERFIS points ANM9112U and ANM9113L have a BAD quality code. HNP IT has been notified and they are evaluating the ERFIS points.</li></ul>
<b>Initiating Cue:</b>	<p>The CRS has directed you to perform a <u>manual</u> QPTR IAW OST-1039, CALCULATION OF QPTR, AND evaluate the actions, if any, of the applicable Technical Specification. The Power Range NIS indications are provided.</p> <p><b>For the purposes of the examination, there will be no independent verification. Show values of your work.</b></p>

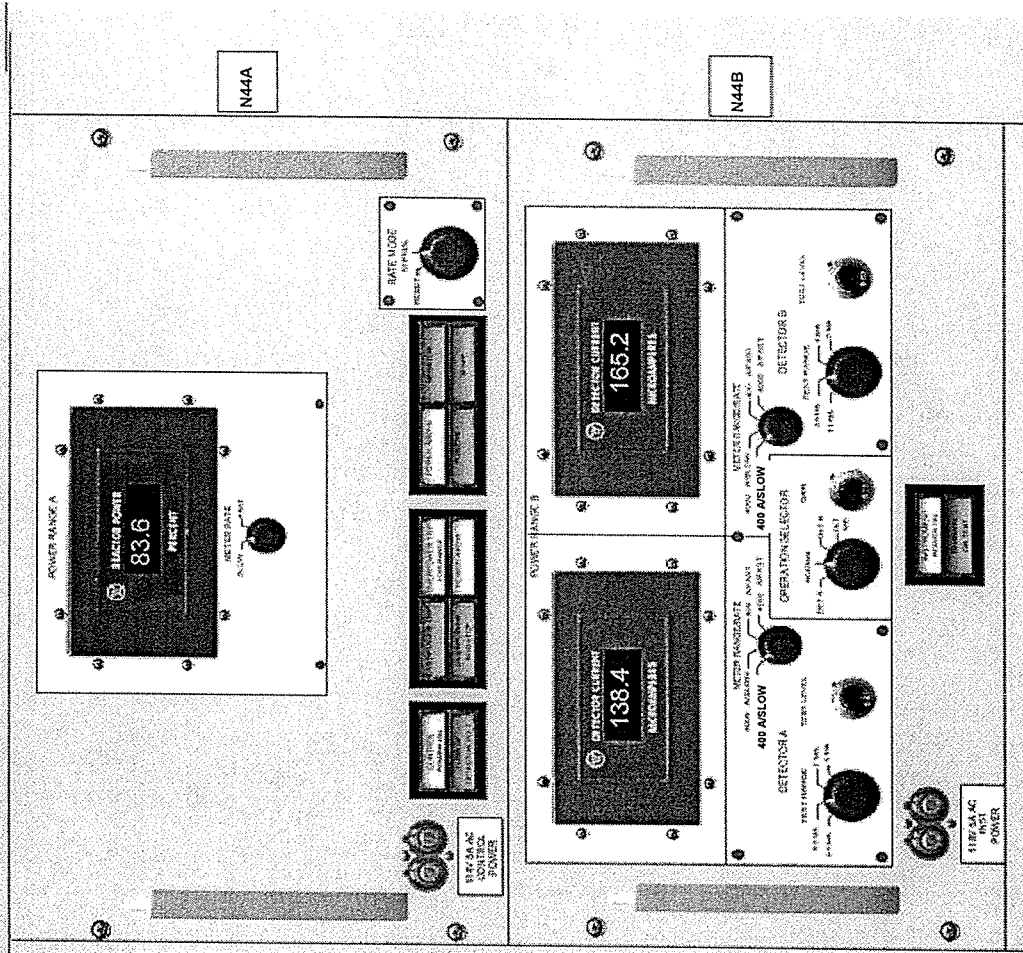
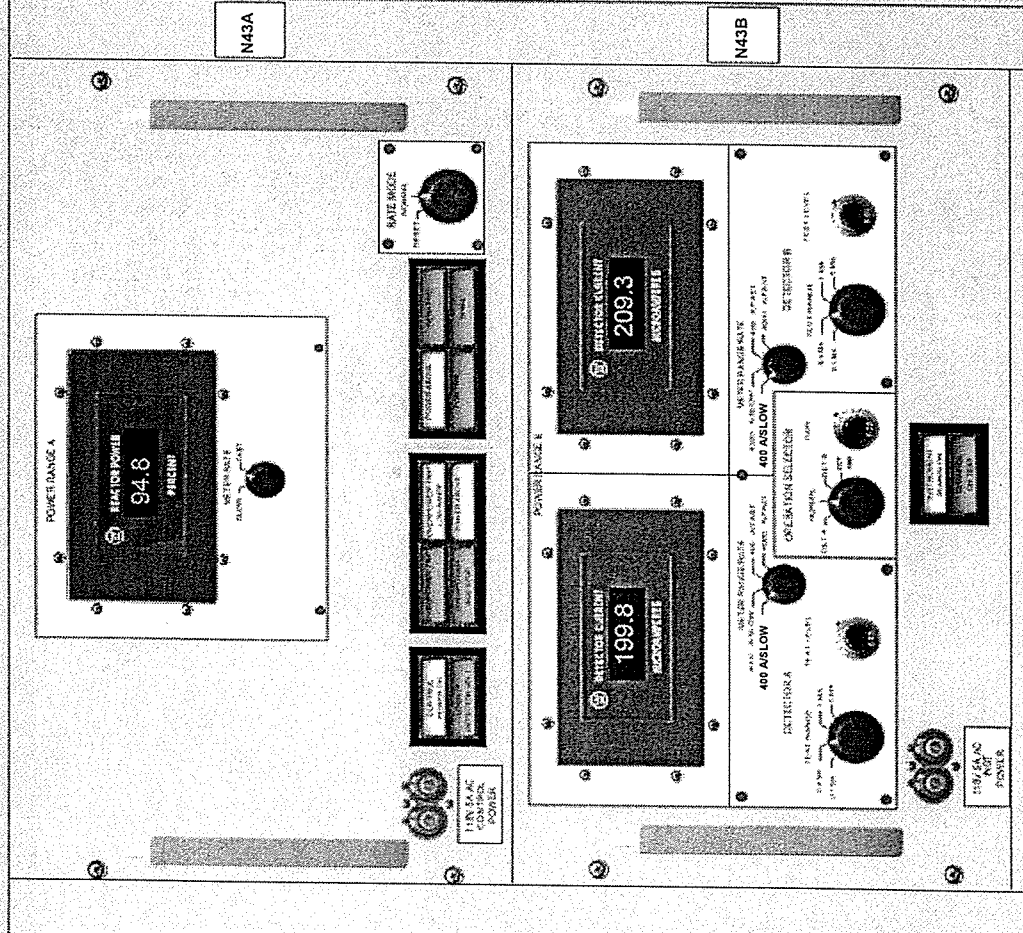
NUCLEAR INSTRUMENTATION  
PROTECTION CHANNEL II





# mg house

**NUCLEAR INSTRUMENTATION  
PROTECTION CHANNEL III**

NUCLEAR INSTRUMENTATION  
PROTECTION CHANNEL IV

Current and Voltage Setpoints Table  
(100% Power, 0% Incore Axial Offset)

Channel #	Top Current ( $\mu$ A)	Bottom Current ( $\mu$ A)
N41	164.1	183.0
N42	187.6	200.4
N43	207.2	224.7
N44	169.1	199.1

Curve No.	F-18-8	Rev. 6
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## Worksheet

Facility: Shearon Harris

Task No.:

Task Title: Using survey maps determine stay timesJPM No.: 2013 NRC Exam Admin JPM RO SRO A-3

K/A Reference: G.2.3.4 RO 3.2 SRO 3.7

**Alternate Path: No**

Examinee: \_\_\_\_\_

NRC Examiner: \_\_\_\_\_

Facility Evaluator: \_\_\_\_\_

Date: \_\_\_\_\_

Method of testing:

Simulated Performance:

Actual Performance: X

Classroom

X

Simulator

Plant

**READ TO THE EXAMINEE**

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

**Initial Conditions:**

Two individuals are tasked to hang a clearance on 1CS-38, Letdown PCV Isol Vlv. The clearance includes the following valves:

- 1CS-35, Inlet Isol Vlv to LTDN PCV
- 1CS-36, Inlet Isol Vlv to LTDN PCV Drain Vlv
- 1CS-37, Inlet Isol to LTDN PCV Drain Vlv
- 1CS-38, Letdown PCV Isol Vlv.
- 1CS-39, Outlet Isol Vlv to LTDN PCV Drain Vlv
- 1CS-40, Outlet Isol to LTDN PCV Drain Isol Vlv
- 1CS-43, Outlet Isol Vlv to LTDN PCV

**Initiating Cue:**

Two Operators are being assigned to hang a clearance and perform work in a radiological area. Operator 1 has an accumulated annual Whole Body dose of 1750 mrem (Duke Energy Progress). Operator 2 has an accumulated annual Whole Body dose of 700 mrem (Duke Energy Progress) and worked at Nine Mile Point earlier this year where he has accumulated 2550 mrem.

The clearance and work activity is for 1CS-38, Letdown PCV Isol Vlv. The ALARA group has determined that additional shielding is not warranted for this work.

Using the supplied survey map, determine the maximum allowable individual stay times for each Operator that would prevent exceeding the Progress Energy Annual Administrative dose limit while performing these activities.

Do not consider dose received during transit. The calculated dose should be ONLY what they would receive while working at the valves for the clearance.

Complete the information below and return to the evaluator when complete.

*Rec'd  
7/8/13*

## Worksheet

Task Standard: Calculation of stay times based on survey maps, two hours for Operator 1, six hours for Operator 2.

Required Materials: Survey map A45  
RAB 236' LETDOWN & LETDOWN REHEAT HX &VG Map 21  
SFD-5-S-1304

General References: DOS-NGGC-0004, Administrative Dose Limits" Section 9.3, Duke Energy Progress Annual Administrative Dose Limits (Rev.12)  
LIMIT = 2 REM Duke Energy Progress dose not to exceed 4 REM total dose if Non-Duke Energy Progress dose for the current year has been determined.

Time Critical Task: No

Validation Time: 10 minutes

Critical Task Justification	
Step 1	Must determine dose rates in order to calculate stay time
Step 2	Must determine available dose to determine stay time.
Step 3	IF incorrect calculation of stay time is made the individuals could exceed their dose limits.

## PERFORMANCE INFORMATION

START TIME: \_\_\_\_\_

**Evaluator Note:****The order of performance does not matter****IF THE APPLICANT ASKS FOR IT: Provide a copy of DOS-NGGC-0004, Rev. 12**

- ✓ **Performance Step: 1** Using Radiological Survey Record Map A45 and RAB 236' LETDOWN & LETDOWN REHEAT HX & VG Map 21, determines dose rates in the area where the clearance will be applied

**Standard:** Identifies that General Area Dose Rates are 125 mrem/hr

**Comment:**

- ✓ **Performance Step: 2** Determine the remaining dose for the year for each individual

**Standard:** Operator 1: **250 mrem**  
2000 mrem - 1750 mrem = 250 mrem

Operator 2: **750 mrem**  
4000 mrem - 700 mrem (PE) - 2550 mrem (NMP) = 750 mrem

**Comment:**

## PERFORMANCE INFORMATION

- ✓ **Performance Step: 3** Determine stay time for each operator (based on 1st Operator reaching 2 Rem and the 2nd Operator reaching 4 Rem - for the year)

**Standard:**Operator 1: **2 hours** $250 \text{ mrem} \div 125 \text{ mrem/hr} = 2 \text{ hrs}$ Operator 2: **6 hours** $750 \text{ mrem} \div 125 \text{ mrem/hr} = 6 \text{ hours}$ **Comment:****Terminating Cue:**

After the stay time has been calculated, this JPM is complete.

END OF JPM

**STOP TIME:** \_\_\_\_\_

## VERIFICATION OF COMPLETION

Job Performance Measure No.: 2013 NRC Exam Admin JPM RO SRO A-3 - Using survey maps determine stay times. (DOS-NGGC-0004 Rev. 12)  
DOS-NGGC-0004, Administrative Dose Limits, Section 9.3,  
Duke Energy Progress Annual Administrative Dose Limits.  
LIMIT = 2 REM Progress Energy dose not to exceed 4 REM  
total dose if Non-Duke Energy Progress dose for the current  
year has been determined.

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Question:

Response:

Result: SAT \_\_\_\_\_ UNSAT \_\_\_\_\_

Examiner's Signature: \_\_\_\_\_ Date: \_\_\_\_\_

## JPM CUE SHEET

Name: \_\_\_\_\_

Date: \_\_\_\_\_

**Initial Conditions:**

Two individuals are tasked to hang a clearance on 1CS-38, Letdown PCV Isol Vlv. The clearance includes the following valves:

- 1CS-35, Inlet Isol Vlv to LTDN PCV
- 1CS-36, Inlet Isol Vlv to LTDN PCV Drain Vlv
- 1CS-37, Inlet Isol to LTDN PCV Drain Vlv
- 1CS-38, Letdown PCV Isol Vlv.
- 1CS-39, Outlet Isol Vlv to LTDN PCV Drain Vlv
- 1CS-40, Outlet Isol to LTDN PCV Drain Isol Vlv
- 1CS-43, Outlet Isol Vlv to LTDN PCV

**Initiating Cue:**

Two Operators are being assigned to hang a clearance and perform work in a radiological area. Operator 1 has an accumulated annual Whole Body dose of 1750 mrem (Duke Energy Progress). Operator 2 has an accumulated annual Whole Body dose of 700 mrem (Duke Energy Progress) and worked at Nine Mile Point earlier this year where he has accumulated 2550 mrem.

The clearance and work activity is for 1CS-38, Letdown PCV Isol Vlv. The ALARA group has determined that additional shielding is not warranted for this work.

Using the supplied survey map, determine the maximum allowable individual stay times for each Operator that would prevent exceeding the Duke Energy Progress Annual Administrative dose limit while performing these activities.

Do not consider dose received during transit. The calculated dose should be ONLY what they would receive while working at the valves for the clearance.

Complete the information below and return to the evaluator when complete.

Record the maximum allowable stay time calculations below to the nearest hour and minute.

Operator 1: \_\_\_\_\_ Operator 2: \_\_\_\_\_



## JPM CUE SHEET

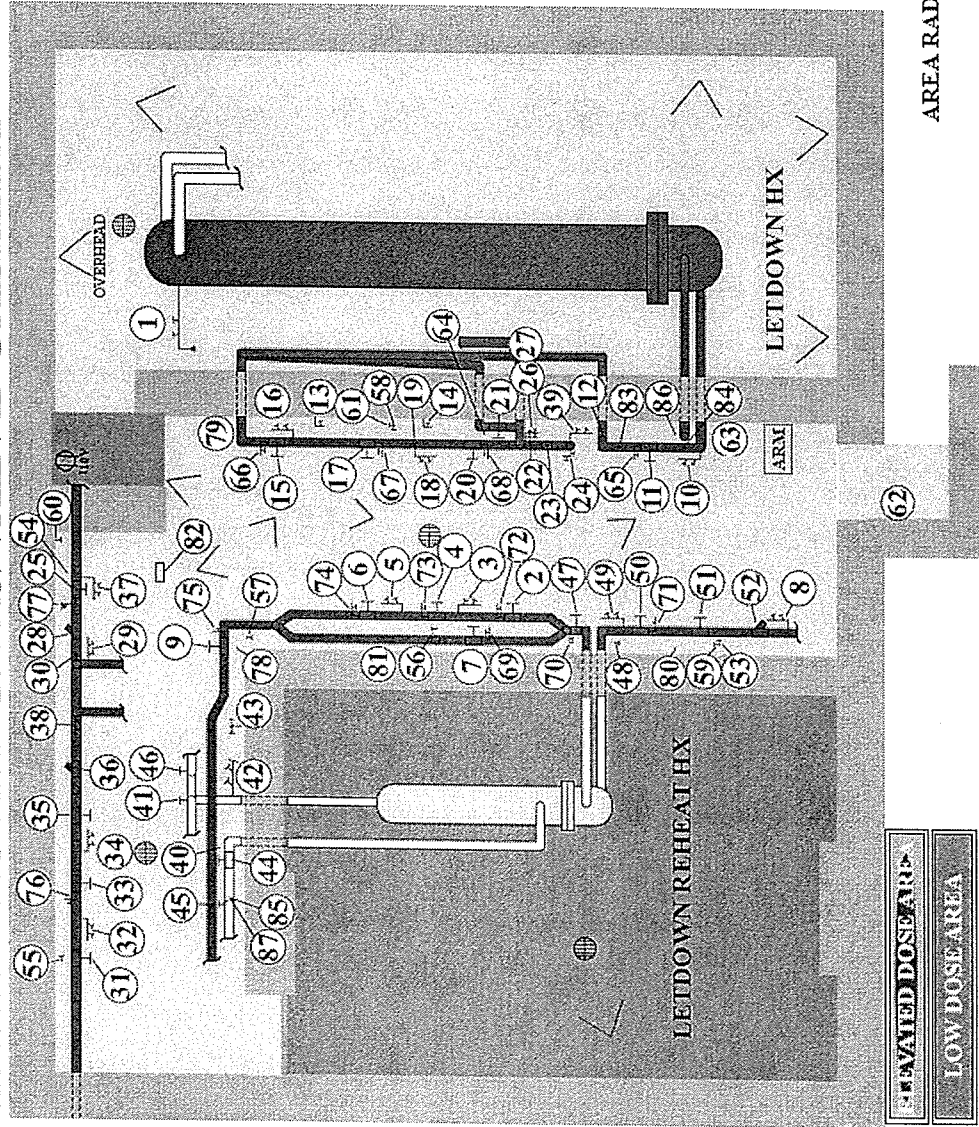
RAB 236' LETDOWN & LETDOWN REHEAT HEAT EXCHANGERS AND V/G											
ITEM	DESCRIPTION	ELEV.(ft.)	ITEM	DESCRIPTION	ELEV.(ft.)	ITEM	DESCRIPTION	ELEV.(ft.)	ITEM	DESCRIPTION	ELEV.(ft.)
1	ICC-329/330	1'	38	ICS-105/106	5'	75	IVL-60	1'			
2	ICS-016	2'	39	ICS-313/314	7'	76	IVL-61	2'			
3	ICS-017/18	1'	40	ICS-315/316	4'	77	IVL-62	2'			
4	ICS-019	2'	41	ICS-596	5'	78	EP-01CS-0142W	4'			
5	ICS-020/21	1'	42	ICS-597/598	1'	79	EP-01CS-0145W	4'			
6	ICS-022	2'	43	ICS-599/600	4'	80	EP-01CS-0381AW	4'			
7	ICS-023	8'	44	ICS-601	6'	81	EP-01CS-0381BW	4'			
8	ICS-026/27	1'	45	ICS-602	6'	82	PI-01CS-0146SW	4'			
9	ICS-028	3'	46	ICS-670	6'	83	TE-01CS-143W	4'			
10	ICS-029/30	1'	47	ICS-671	4'	84	TE-01CS-144W	4'			
11	ICS-031	4'	48	ICS-672/673	8'	85	TE-01CS-381W	5'			
12	ICS-032	4'	49	ICS-674/675	1'	86	TI-01CS-7242S	9'			
13	ICS-033	10'	50	ICS-676	2'	87	TI-01CS-7248S	5'			
14	ICS-034	10'	51	ICS-677	2'						
15	ICS-035	2'	52	ICS-678	2'						
16	ICS-036/37	1'	53	IIA-0158-I2	6'						
17	ICS-038	2'	54	IIA-0158-I5	6'						
18	ICS-039/40	1'	55	IIA-0158-I6	6'						
19	ICS-041/42	3'	56	IIA-0158-I7	6'						
20	ICS-043	2'	57	IIA-0158-I8	6'						
21	ICS-044	6'	58	IIA-0158-I9	6'						
22	ICS-045/46	6'	59	IIA-1226	6'						
23	ICS-047	6'	60	IIA-1229	6'						
24	ICS-048/49	6'	61	IIA-1428	6'						
25	ICS-050	4'	62	IPM-72	10'						
26	ICS-051	2'	63	ISP-1185	6'						
27	ICS-052	6'	64	ISP-1188	1'						
28	ICS-053	4'	65	IVL-50	3'						
29	ICS-054/55	5'	66	IVL-51	2'						
30	ICS-056	5'	67	IVL-52	2'						
31	ICS-095	3'	68	IVL-53	2'						
32	ICS-096/97	1'	69	IVL-54	4'						
33	ICS-098	3'	70	IVL-55	4'						
34	ICS-099/100	1'	71	IVL-56	1'						
35	ICS-101	3'	72	IVL-57	2'						
36	ICS-102	3'	73	IVL-58	2'						
37	ICS-103/104	1'	74	IVL-59	2'						EXTEND 94-28

REVISION 04-08

## JPM CUE SHEET

# RAB 236' LETDOWN & LETDOWN REHEAT HEAT EXCHANGERS/VALVE GALLERY

MAP 21

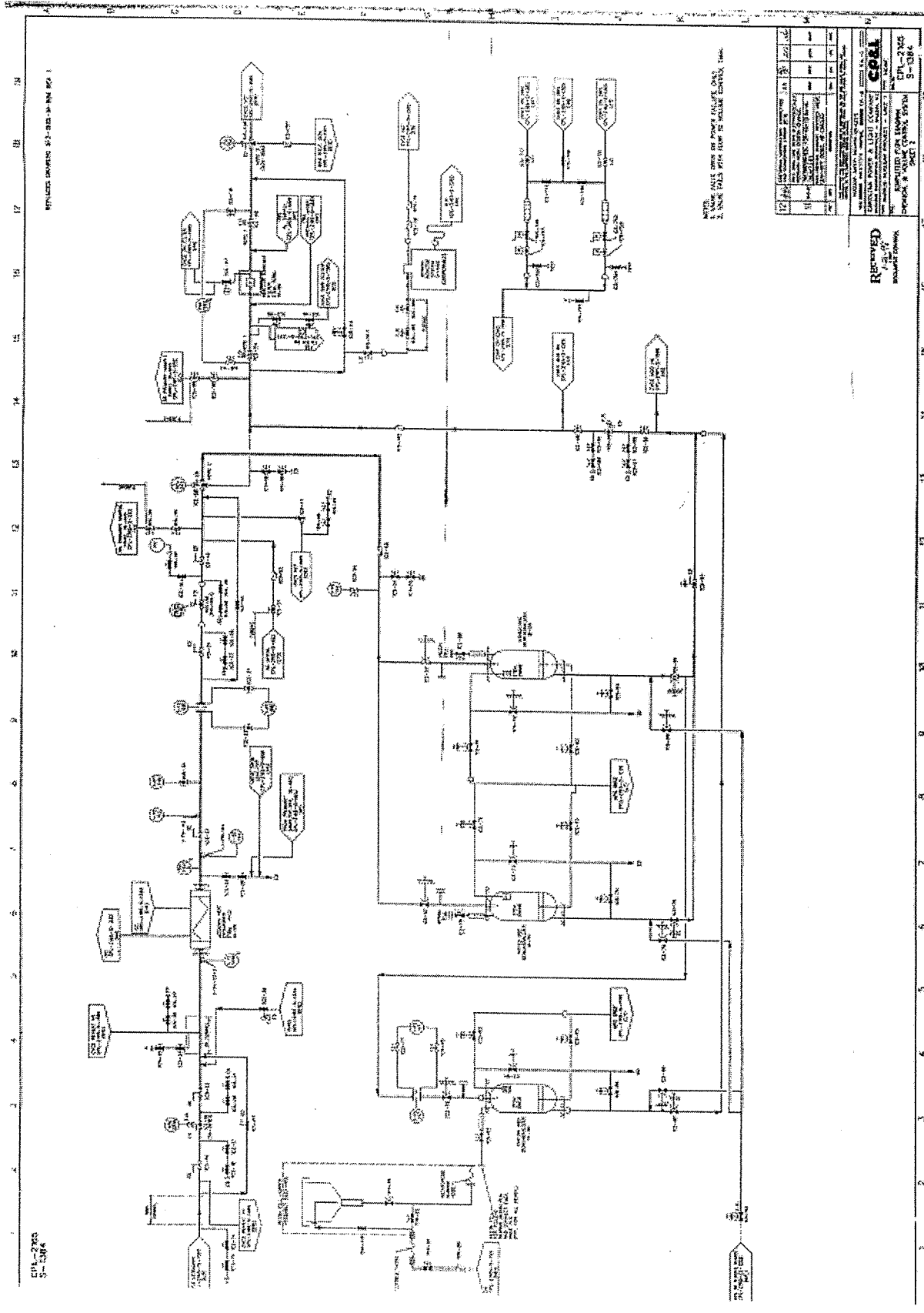


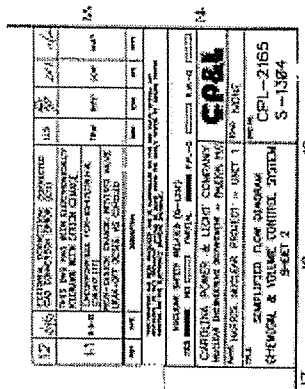
## Map A45

## Page 1 of 1

Unit 1	Bldg/Elev: RAB 236'	Area: Letdown HX & VG	Date: 09/13/13	Time: 0735	RWP # 5648	Survey # 0992-013
Component: N/A		Work Description: Clearance and work on ICS-38				
Surveyor: A. Tech		Signature: [Signature]	Reviewed by: B. Bossmann			
Comments: No entry required into letdown H/X room, no shielding added for job						
RA Radiation Area	HRA High Radiation Area	LHRA Locked High-Radiation Area	VHRA Very High Radiation Area	ARA Airborne Radiation Area	CA Contamination Area	RMMA Radioactive Materials Area
Dose Rates in mrem/hr unless otherwise noted	Beta Dose Rate R Rem/hour	Neutron Dose Rate R Rem/hour	Air Activity % DAC	% Power 100	Instrument	Serial No./UTC
			No. _____ DAC _____ % Activity _____ uCi/cc		R034	341188
			No. _____ DAC _____ % Activity _____ uCi/cc		K070	777441
			No. _____ DAC _____ % Activity _____ uCi/cc			

### Q.A Record





Facility: Shearon-Harris Task No.: 345001H602  
 Task Title: Classify an EAL JPM No.: 2013 NRC Exam  
 Admin JPM SRO A4

K/A Reference: G2.4.41 RO 2.9 SRO 4.6 **Alternate Path: No**

Examinee: \_\_\_\_\_ NRC Examiner: \_\_\_\_\_  
 Facility Evaluator: \_\_\_\_\_ Date: \_\_\_\_\_

**Method of testing:** This JPM can be performed in any setting with the required references available.

Simulated Performance: \_\_\_\_\_ Actual Performance:   X    
 Classroom   X   Simulator \_\_\_\_\_ Plant \_\_\_\_\_

### READ TO THE EXAMINEE

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

#### Initial Conditions:

You are the Site Emergency Coordinator.

Given the following plant conditions:

- The plant is in Mode 1
- A-SA Safety train is in service
- AOP-016 is being performed due to a 12 gpm leak in C SG

The following occurs at 1115:

- Offsite Power is lost
- Reactor trips on undervoltage for all 3 RCPs
- Safety Injection actuates due to a steam leak inside containment
- Containment pressure stabilizes at 3.6 psig

At 1120:

- BOP reports 1BD-20, Stm Gen B Bldn Isol. and 1BD-30 SA, Stm Gen B Bldn Isol failed to close automatically or manually
- Sanford Substation Maintenance reports that their truck brakes failed and it has crashed into Breaker 52-13 damaging the breaker and the connecting transmission lines

The time is now 1125:

For the above plant conditions, classify the event.

#### Initiating Cue:

Evaluate the EAL Matrix and determine the highest classification required for these plant conditions. **This is a time critical JPM.**

*Rec'd  
7/12/13*

Task Standard: Classify the highest EAL as an ALERT

Required Materials: None

General References: PEP-110 EAL Matrix  
PEP-110  
EP-EAL (allowed reference)

Handouts:

- Attached Initial Conditions
- PEP-110
- PEP-110 EAL Matrix
- EP-EAL

Time Critical Task: YES – 15 minutes for classification.

Validation Time: 15 minutes

CRITICAL TASK JUSTIFICATION	
<b>Step 1</b>	Classification of the event is critical for determining State and County notifications, public information notices, site information notices, and event reportability to the Nuclear Regulatory Commission.

**Evaluator Cue:****Start Time for this portion of JPM begins when the individual has been briefed.****START TIME:** \_\_\_\_\_

- ✓ **Performance Step: 1** Identify EAL Classification for events in progress.

**Standard :**The correct EAL is: **Alert HA1.6**Vehicle crash resulting in **EITHER:**Visible damage (Note 4) to **any** Table H-1 structure containing systems or components required for safe shutdown of the plant  
**OR**

Control Room indication of degraded performance of systems required for the safe shutdown of the plant (Table H-1)

**Comments:****STOP TIME:** \_\_\_\_\_**Terminating Cue:****EAL classification(s) completed and provided to evaluator.**



Job Performance Measure No.: 2013 NRC Exam Admin JPM SRO A4  
Classify an Event

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Question:

Response:

Result: SAT \_\_\_\_\_ UNSAT \_\_\_\_\_

Examiner's Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Name: \_\_\_\_\_

Date: \_\_\_\_\_

<b>Initial Conditions:</b>	<p>You are the Site Emergency Coordinator.</p> <p>Given the following plant conditions:</p> <ul style="list-style-type: none"><li>• The plant is in Mode 1</li><li>• A-SA Safety train is in service</li><li>• AOP-016 is being performed due to a 12 gpm leak in C SG</li></ul> <p>The following occurs at 1115:</p> <ul style="list-style-type: none"><li>• Offsite Power is lost</li><li>• Reactor trips on undervoltage for all 3 RCPs</li><li>• Safety Injection actuates due to a steam leak inside containment</li><li>• Containment pressure stabilizes at 3.6 psig</li></ul> <p>At 1120:</p> <ul style="list-style-type: none"><li>• BOP reports 1BD-20, Stm Gen B Bldn Isol. and 1BD-30 SA, Stm Gen B Bldn Isol failed to close automatically or manually</li><li>• Sanford Substation Maintenance reports that their truck brakes failed and it has crashed into Breaker 52-13 damaging the breaker and the connecting transmission lines</li></ul> <p>The time is now 1125: For the above plant conditions, classify the event.</p>
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<b>Initiating Cue:</b>	<p>Evaluate the EAL Matrix and determine the classification(s) required for these plant conditions.</p> <p><b>This is a time critical JPM.</b></p>
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EAL Classification:

EAL: \_\_\_\_\_